



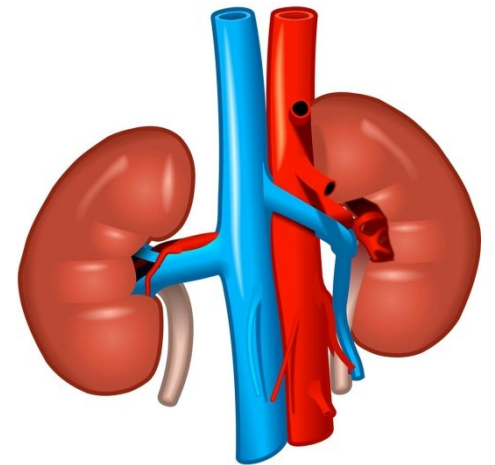
Armed Forces College of Medicine AFCM





Diseases of the kidney & urinary bladder

**Prof Dr Nermeen
Salah**





Lecture (5)

Congenital anomalies of the kidney, Renal failure & cystitis



INTENDED LEARNING OBJECTIVES (ILOs)

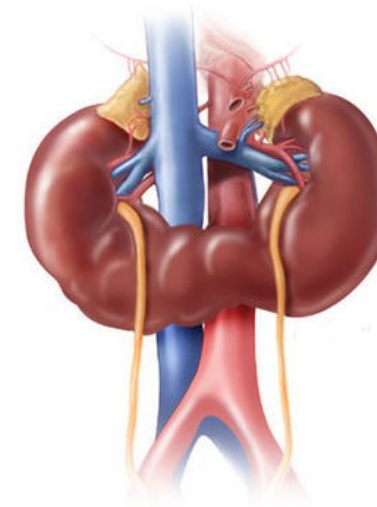
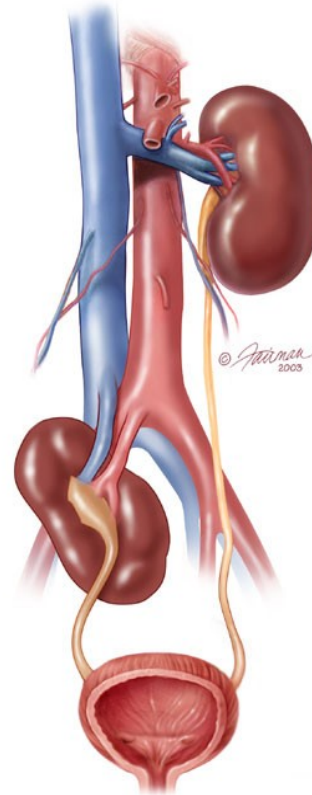


By the end of this lecture the student will be able to:

1. Enumerate the congenital anomalies of the kidney
2. Describe the pathological features of adult and infantile polycystic disease of kidney
3. List the causes of acute and chronic renal failure
4. Describe the congenital anomalies of urinary bladder.
5. Determine the clinical picture ,etiology , histopathological features and complications of acute cystitis.
6. Describe the pathological features of chronic non



Congenital anomalies of the kidney



4-Horse shoe kidney

ed at their lower pole

https://en.wikipedia.org/wiki/Horseshoe_kidney

<https://www.urologyhealth.org/urologic-conditions/ectopic-kidney>

<https://radiopaedia.org/images/3096145> <https://www.pinterest.com>

1-Renal agenesis

absent

2-Renal hypoplasia

undersized

3-Ectopic kidney

not ascending to its normal position

Endocrine and genitourinary module

09/20/2024

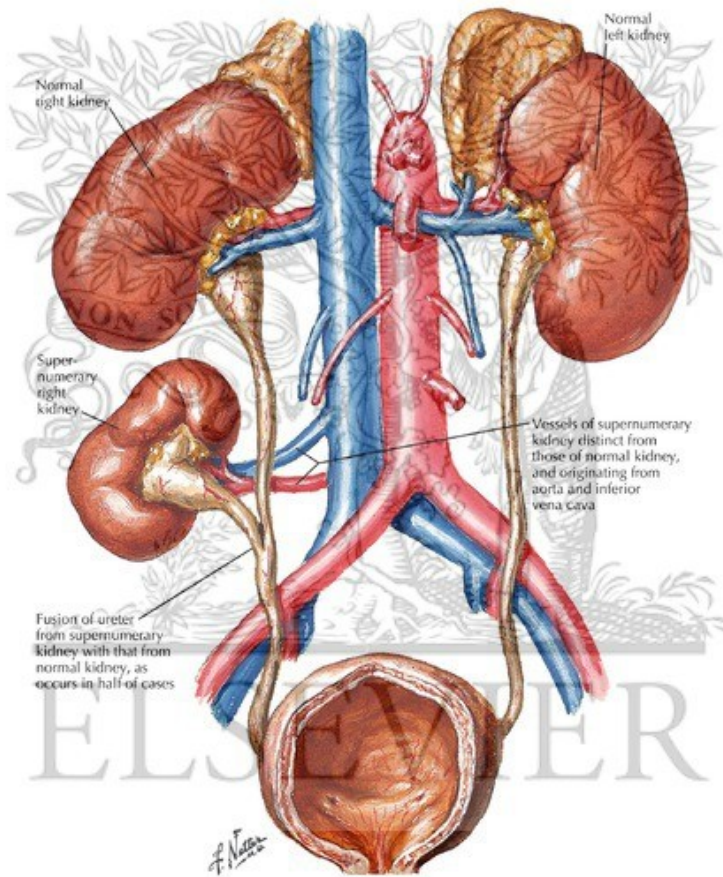
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Congenital anomalies of the kidney

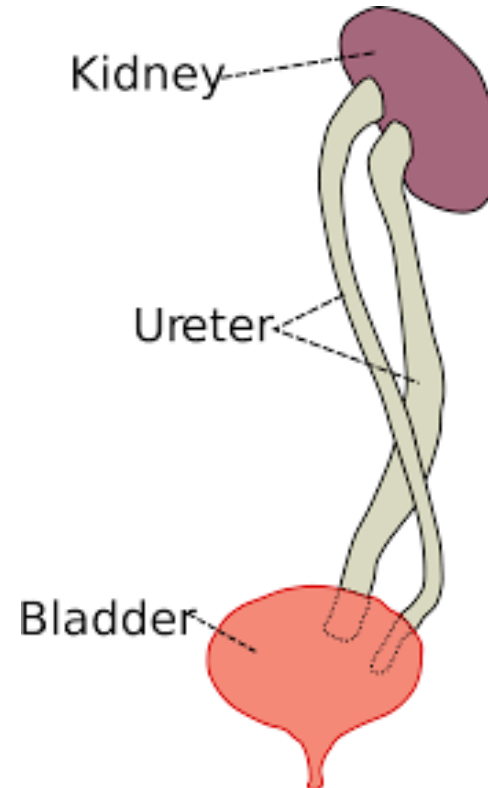


SUPERNUMERARY KIDNEY



5-Supernumerary kidneys

09/20/2024



6-Double ureter

Endocrine and genitourinary module



7-Double renal pelvis



Adult polycystic disease of the kidney



Pathogenesis:

Autosomal dominant inheritance (**AD**)
Mutation of the **PKD1** or **PKD2** gene encoding **polycystin 1,2**
proteins respectively



Altered tubular epithelial growth and differentiation



Cell proliferation ,fluid secretion ,loss of resorptive capacity



Renal cysts

at any level of the nephron, from tubules to collecting ducts



Adult polycystic disease of the kidney



Gross

- ❑ Both kidneys are enlarged
- ❑ Show numerous cysts
 - Small or large
 - Containing clear or hemorrhagic brownish fluid
 - With smooth lining
 - Not communicate with renal pelvis
 - Enlarge as patient grows
→ pressure atrophy of renal parenchyma



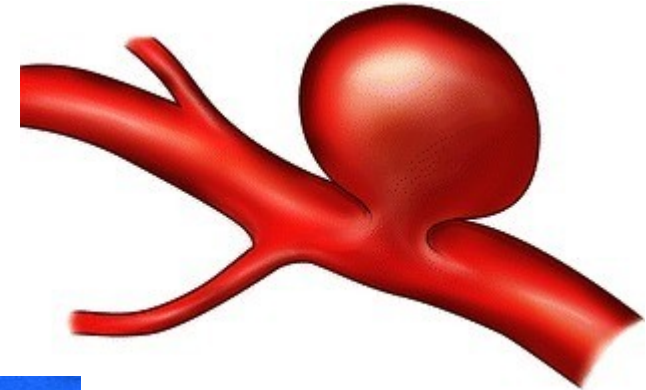
Adult polycystic disease of the kidney



N.B:

May be associated with
cystic liver & cerebral berry
aneurysms

Cystic liver



<https://som.uthscsa.edu/neurosurgery/patient-care/cerebrovascular/brain-aneurysms/>

Complications

- ☐ Hematuria
- ☐ Chronic renal failure
- ☐ Hypertension



Cerebral berry aneurysms
(weakness in arterial wall)

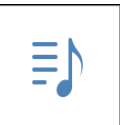
<http://www.svuhradiology.ie/case-study/polycystic-liver-disease/>



Infantile /childhood polycystic disease of the kidney



- ❑ Autosomal recessive inheritance (AR)
- ❑ Mutation in the PKHD1 gene
- ❑ A rare condition
- ❑ Associated with congenital hepatic fibrosis
- ❑ Renal cystic affection is much more marked than the adult type
- ❑ Death occurs during infancy or childhood due to renal failure



Renal failure



Definition:

This is failure of kidneys to eliminate into urine the toxic compounds that normally exist in blood (waste metabolic products).

Types:

1. Acute renal failure
2. Chronic renal failure



1- Acute Renal failure



- ❑ There is oliguria (a 24 hour urine volume less than 400 ml)
- ❑ Rapid onset of azotaemia (Elevation of blood urea & creatinine levels)

Causes

Severe reduction in glomerular filtration



A-Prerenal:

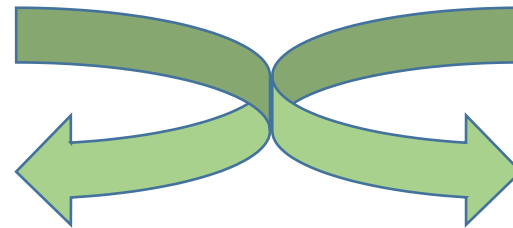
- ❑ Shock (burns, hemorrhage)

B-Renal:

- ❑ Acute post streptococcal glomerulonephritis
- ❑ rapidly progressive glomerulonephritis

C-Postrenal:

- ❑ Complete prolonged obstruction of



Acute failure of tubular epithelium



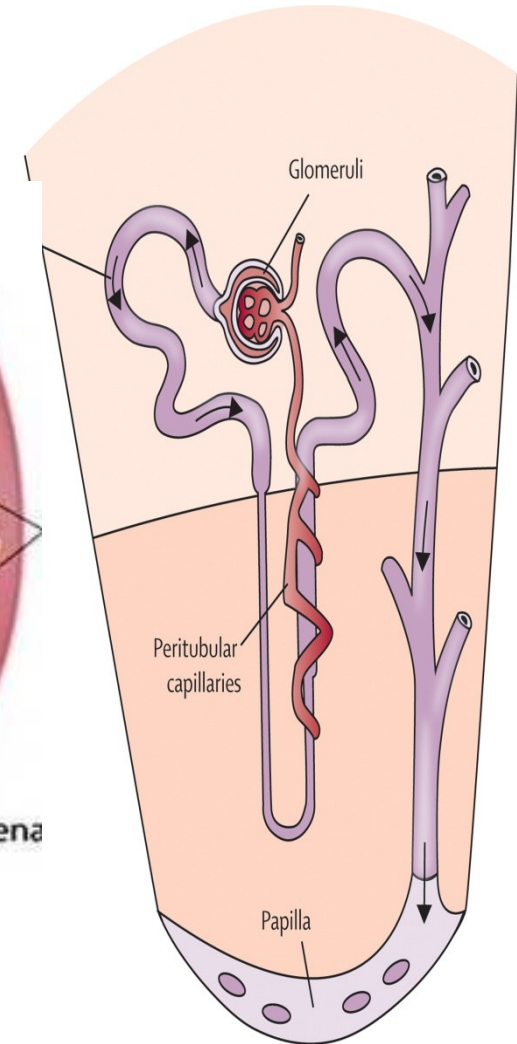
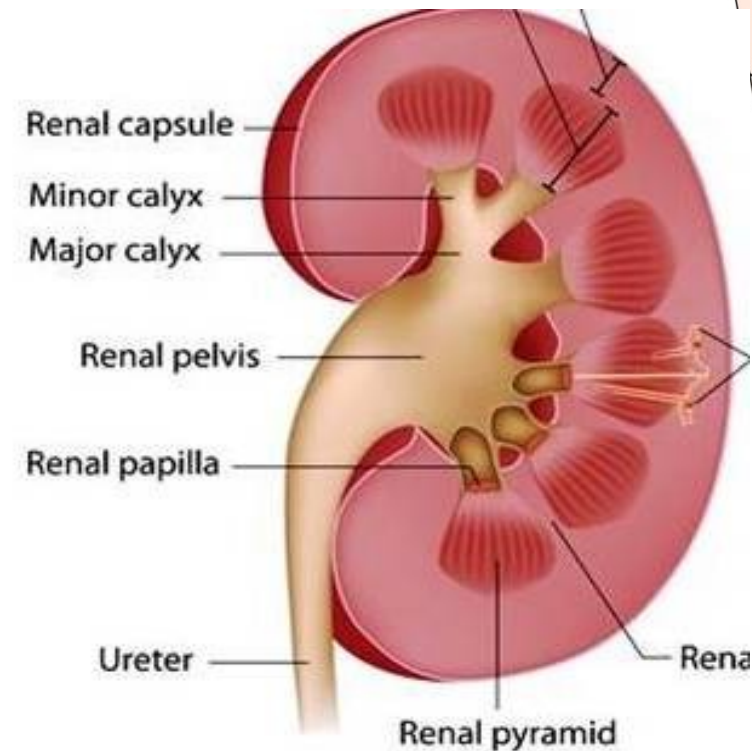
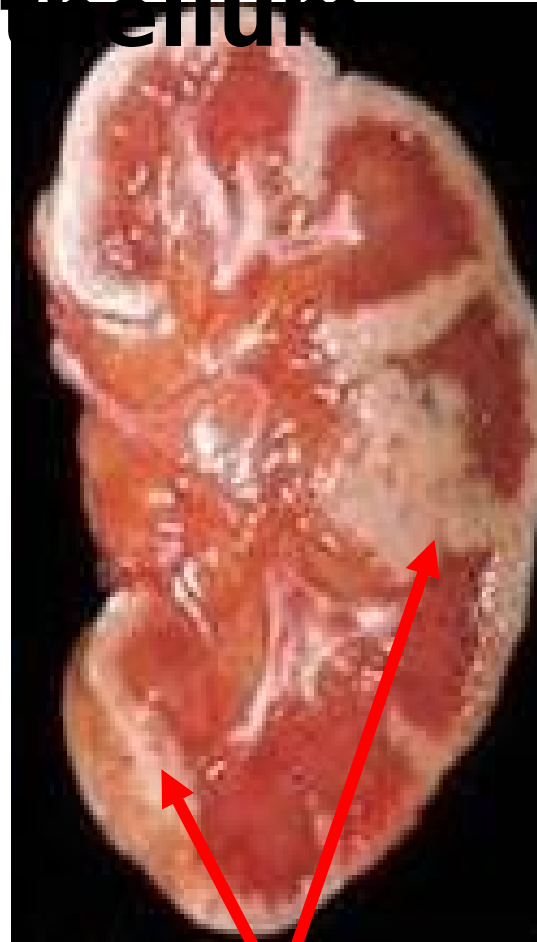
- ❑ **Acute tubular injury (TOXIC OR ANOXIC)**
- ❑ Acute pyelonephritis
- ❑ Renal cortical necrosis
- ❑ Papillary necrosis





Acute failure of tubular

epithelium



**Papillary
necrosis**

https://www.pig333.com/pathology/cases/renal-papillary-necrosis_50

Renal cortical necrosis

<https://www.memorangapp.com>

Endocrine and genitourinary module



2- Chronic Renal failure



❑ It is an end stage of a number of renal diseases

Causes

1. Chronic glomerulonephritis
2. Chronic pyelonephritis
3. Bilateral renal tuberculosis
4. Bilateral hydronephrosis.
5. Bilateral pyonephrosis
6. Polycystic disease of kidney
7. Systemic lupus erythematosus
8. Diabetic nephropathy
9. Amyloidosis
10. Benign Hypertension



Congenital anomalies of urinary bladder

A- Ectopia vesica (exstrophy)

- Absence of anterior wall of the urinary bladder and the overlying anterior abdominal wall
- The mucosal surface of posterior vesical wall is exposed

Complications

- ☐ Urinary tract infection
- ☐ Metaplasia
- ☐ Carcinoma



https://en.wikipedia.org/wiki/Bladder_exstrophy

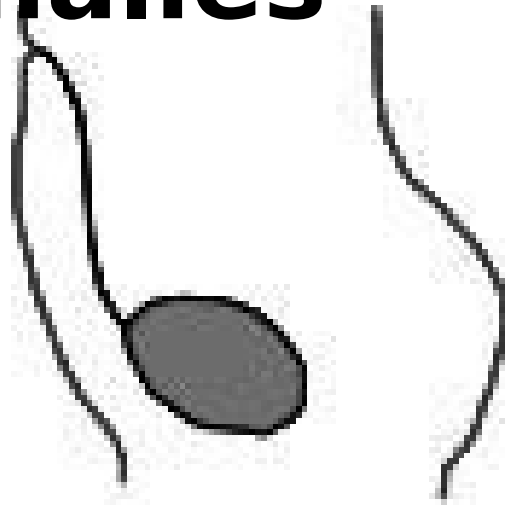


Congenital anomalies

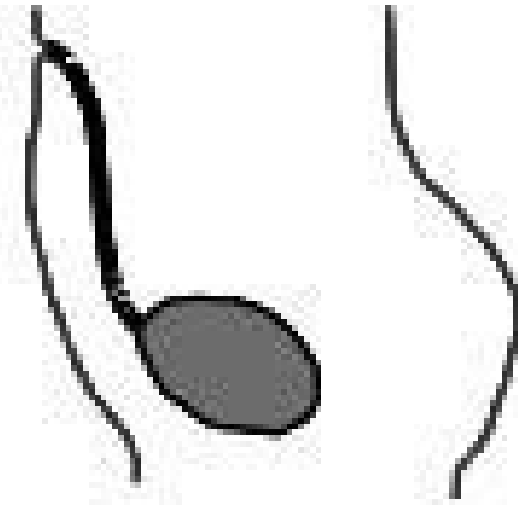


B- Patent urachus

median umbilical ligament



Normal

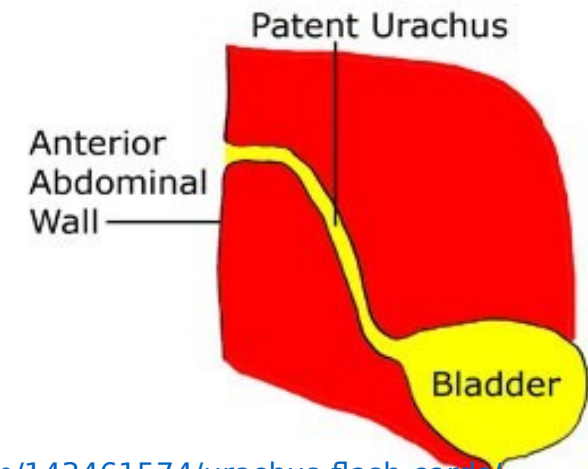


Patent urachus

<https://www.childrenshospitaloakland.org/main/urachal-abnormalities.aspx>

A fistulous tract extends from the bladder to the umbilicus discharging urine to the outside

Increased risk of urinary bladder adenocarcinoma.



Cystitis

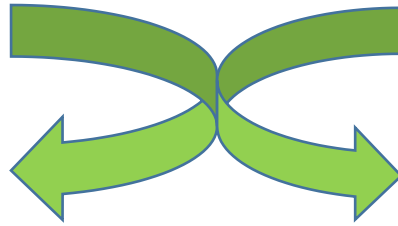


Definition:

Inflammation of the urinary bladder.

Types

Acute cystitis



Chronic cystitis

1-Bacterial cystitis

2-Radiation cystitis

3-Haemorrhagic cystitis:
with chemotherapeutic drugs as
cyclophosphamide

- Chronic non specific
- Chronic specific
(Bilharziasis,
Tuberculosis)

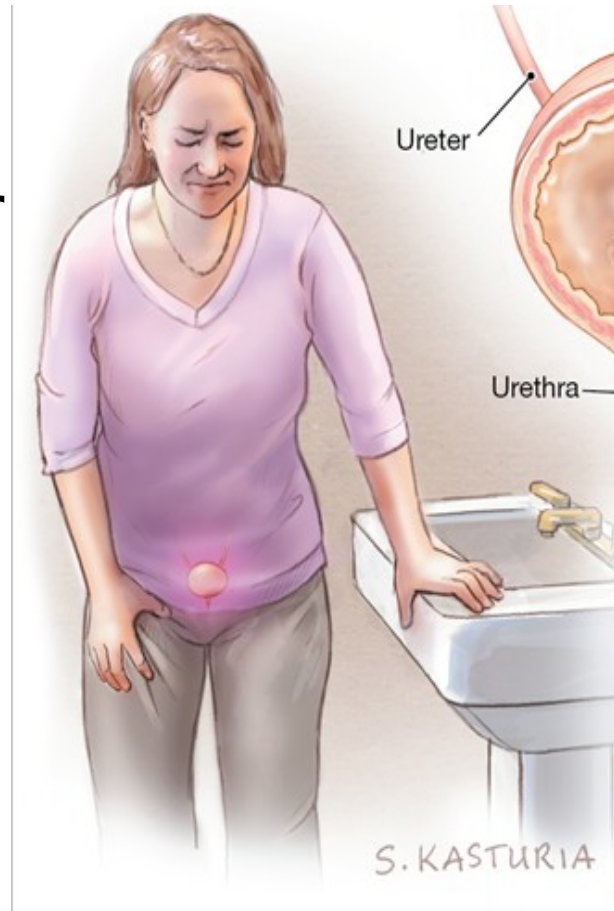


Acute Cystitis



Clinical picture:

- ☐ Frequency of mictur
- ☐ Urgency
- ☐ Dysuria
- ☐ Supra pubic pain
- ☐ Pyuria
- ☐ Hematuria



<http://healthperiodical.blogspot.com>



<http://pusat-vitamin-keluarga.blogspot.com/2014/09/kencing-g-kotor-kencing-tak-lawas.htm>



Acute Cystitis

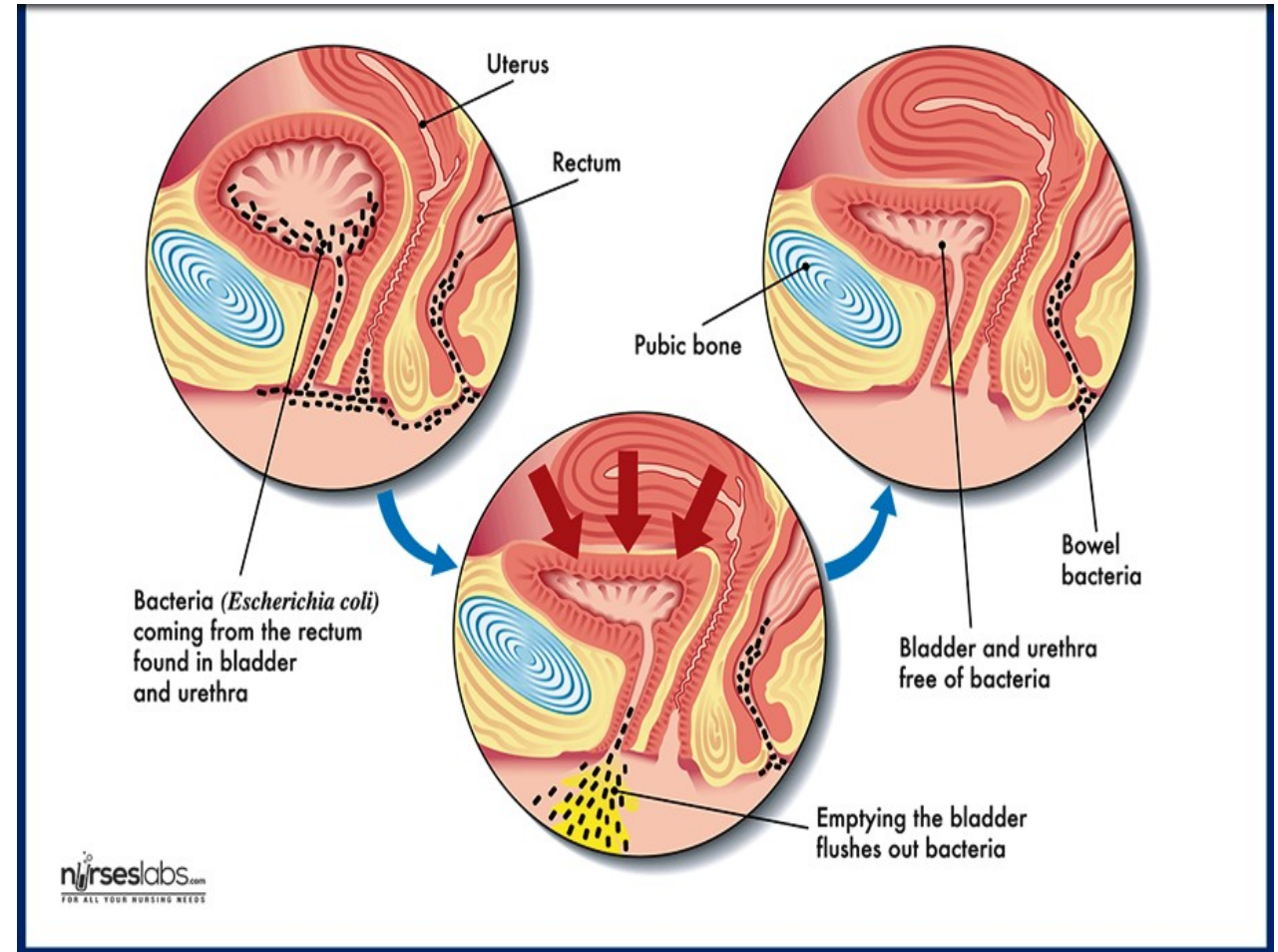


The causative organisms:

- ☐ **E. coli (the commonest)**
- ☐ Staphylococci
- ☐ Streptococci
- ☐ Gonococci

Routes of infection

- ☐ **Direct** from urethra
- ☐ **Descending** from kidney infections
- ☐ **Lymphatic** from pelvic organs
- ☐ **Blood spread** from distant infections



Acute Cystitis



Predisposing factors: Because epithelial lining of urinary bladder is resistant to infection

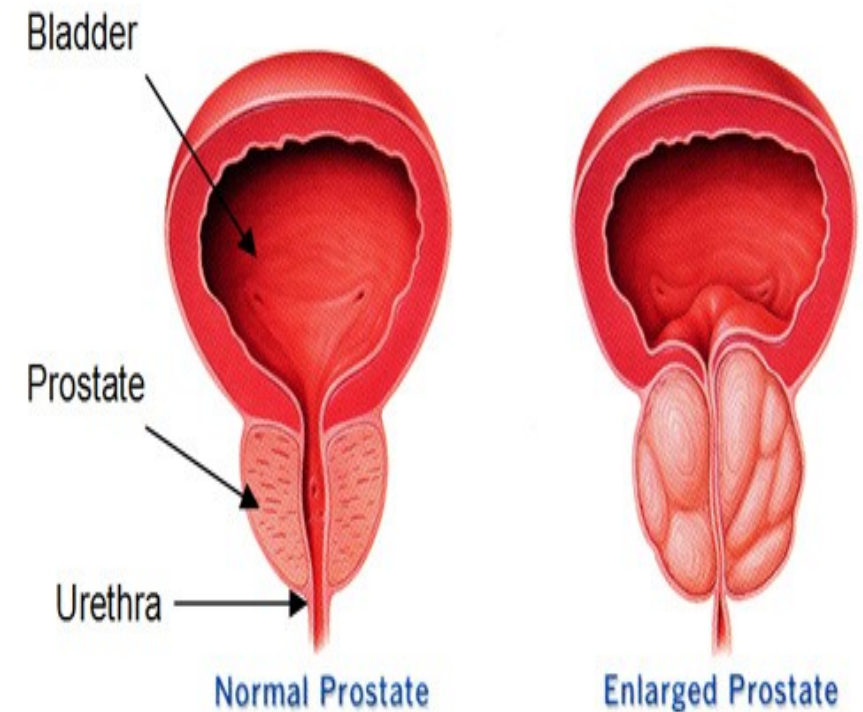
1- **Low immunity** as in diabetes

2- **Stasis of urine**: due to

- ☐ Urethral or bladder neck obstruction
- ☐ Functional abnormalities as spinal cord injuries

3- **Trauma to urinary bladder**: Catheter, cystoscopy

4- **Inflammation of nearby organs** as kidney, ureters, urethra, prostate, vulva, vagina & cervix



Acute Cystitis



Pathology :

1-Mild Inflammation

2-Severe inflammation

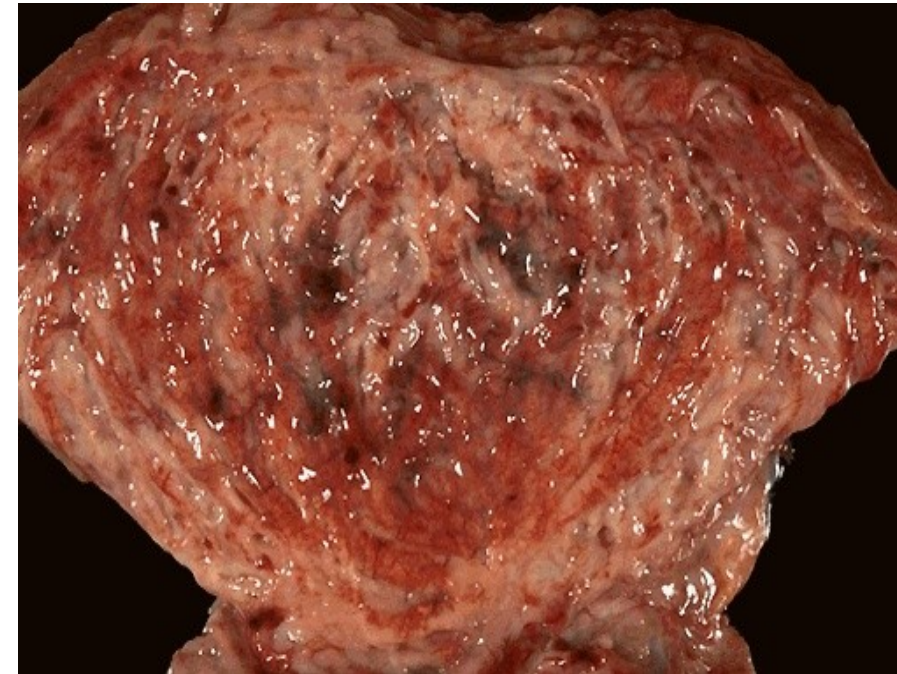
- ❑ Gross: suppurative, ulcerative , hemorrhagic mucosa
- ❑ Mic (acute suppurative inflammation)
 - dilated capillaries, oedema,
 - neutrophils, pus cells ,macrophages.

Complication:

1- Spread of infection as acute pyelonephritis

2- Chronic non specific cystitis

Mucosa of inflamed bladder



<https://webpath.med.utah.edu/RENAHTML/BLAD061.html>



Chronic Cystitis



Cause: Due to repeated acute cystitis

Clinically: Frequency , dysuria, pyuria

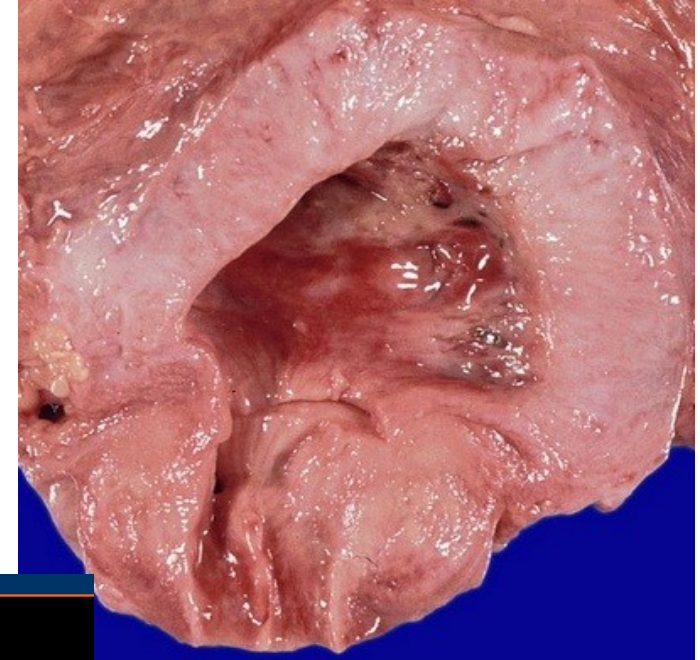
Gross: Thickened & fibrotic wall

Mic :

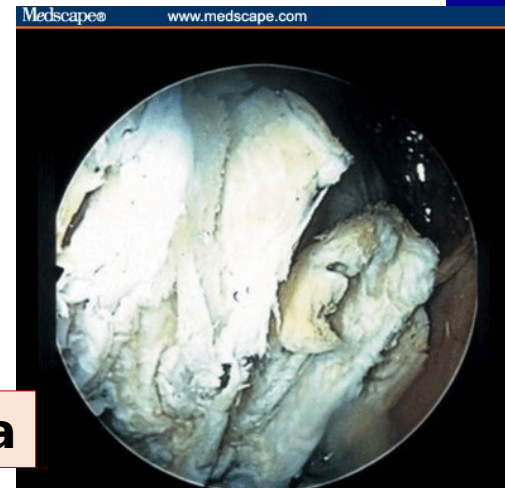
- Chronic inflammatory cells & fibrosis
- Urothelial hyperplasia

Complications

- Stones
- Contracted bladder
- Leukoplakia& carcinoma



www.webpathology.com/image.asp?case=51&n=33



Leukoplakia

Thick white patches



Quiz



Acute renal failure occurs in which of the following conditions?

- A. Polycystic disease of kidney
- B. Rapidly progressive glomerulonephritis
- C. Diabetic nephropathy
- D. Renal amyloidosis



Quiz



Acute renal failure occurs in which of the following conditions?

- A. Polycystic disease of kidney
- B. Rapidly progressive glomerulonephritis**
- C. Diabetic nephropathy
- D. Renal amyloidosis



Quiz



1. Enumerate the predisposing factors of acute cystitis.
2. Describe the pathological features of chronic non specific cystitis and list its complications.



SUGGESTED TEXTBOOKS



1. Robbins basic pathology 10th edition, 2018. Chapter 14: Kidney and its collecting system. Chapter 18: Male genital system and lower urinary tract.
2. Kaplan step 1 pathology lecture notes. Chapter 15: Renal pathology; 2017 (P.143-158)



Thank you



www.FunScrape.com

